

**REMARKS****Claim Rejections - 35 U.S.C. § 103**

The Examiner has rejected claims 1, 4, 6, 7, 11, 12, 13 and 16 under 35 U.S.C. § 103(a) as being unpatentable over Kaufman et al. (US Patent 5,954,997) in view of Feller et al. (US Patent 5,700,383). The Applicant respectfully traverses. Kaufman in view of Feller does not teach all of the elements of the Applicant's invention. Both Kaufman and Feller fail to teach a surfactant containing an alkyltrimethylammonium cation. Therefore, the Applicant respectfully submits that the Applicant's claims are not obvious in light of Kaufman in view of Feller.

The Examiner has rejected claims 2, 3, 8, 9, 10 and 14 under 35 U.S.C. § 103(a) as being unpatentable over Kaufman ('997) in view of Feller ('383) as applied to claims 1 and 11 respectively above, and further in view of Grumbine et al. (US Patent 6,083,419). The Applicant respectfully traverses. The Examiner states that it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Kaufman in view of Feller by using the surfactant cetylmethylammonium hydroxide as taught by Grumbine for the purpose of minimizing surface corrosion on metallic layers. The Applicant respectfully traverses. One of ordinary skill in the art would not combine Kaufman in view of Feller with Grumbine because the surfactant cetylmethylammonium hydroxide taught by Grumbine would destabilize the slurry taught by Kaufman in view of Feller. Kaufman expressly teaches the use of surfactants that stabilize his slurry. In Column 6 lines 34-38 Kaufman states: "In order to promote stabilization of a CMP slurry of this invention against settling, flocculation and decomposition, a variety of optional CMP slurry additives, such as surfactants...can be used." The cetylmethylammonium cation from the cetylmethylammonium hydroxide molecule taught by Grumbine would destabilize the slurry taught by Kaufman in view of Feller because it would combine with the silica abrasive and cause the silica abrasive to clump together in the pH range of 2.5-7.0. Therefore, the

Applicant respectfully submits that the Applicant's claims are not obvious in light of Kaufman in view of Feller, and further in view of Grumbine.

The Examiner has rejected claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Kaufman ('997) in view of Feller ('383) as applied to claim 1 above, and further in view of Neville et al. (US Patent 5,527,423). The Applicant respectfully traverses. Kaufman in view of Feller, and further in view of Neville, do not teach all of the elements of the Applicant's invention. Kaufman, Feller, and Neville all fail to teach a surfactant containing an alkyltrimethylammonium cation. Therefore, the Applicant respectfully submits that the Applicant's claims are not obvious in light of Kaufman in view of Feller, and further in view of Neville.

If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

Date:

01/03/2003

Heather M. Molleur

Heather M. Molleur  
Reg. No. 50,432

12400 Wilshire Boulevard  
Seventh Floor  
Los Angeles, CA 90025-1026  
(408) 720-8300

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS**

1. (Amended) A slurry, comprising a mixture of:  
a surfactant containing an alkyltrimethylammonium cation; a chelating buffer system;  
an abrasive; an oxidizer; and a corrosion inhibitor; wherein the slurry has a pH between 2.5  
and 7.0.
2. The slurry of Claim 1, wherein the surfactant comprises cetyltrimethylammonium  
bromide dissolved in the mixture.
3. The slurry of Claim 1, wherein the surfactant comprises cetyltrimethylammonium  
cations and halogen anions.
4. The slurry of Claim 3, wherein the abrasive comprises silica, the corrosion inhibitor  
comprises benzotriazole, and the oxidizer comprises hydrogen peroxide dissolved in the  
mixture.
5. The slurry of Claim 1, wherein the chelating buffer system comprises ammonium  
bicarbonate and potassium citrate dissolved in the mixture.
6. The slurry of Claim 1, wherein the chelating buffer system is selected from the group  
consisting of citric acid/potassium citrate, and ammonium bicarbonate/potassium citrate.
7. The slurry of Claim 1, wherein the corrosion inhibitor is selected from the group  
consisting of benzotriazole and cetyltrimethylammonium bromide.

8. The slurry of Claim 1, wherein the surfactant comprises between 0.003M and 0.075M cetyltrimethylammonium bromide in the mixture.
9. The slurry of Claim 1, wherein the surfactant comprises cetyltrimethylammonium hydroxide dissolved in the mixture.
10. The slurry of Claim 1, wherein the surfactant comprises both cetyltrimethylammonium hydroxide and cetyltrimethylammonium bromide dissolved in the mixture.
11. (Amended) A copper polish slurry, comprising in combination:  
water, a surfactant containing an alkyltrimethylammonium cation, a chelating buffer system, an abrasive, [a] an oxidizer, and a corrosion inhibitor, wherein the slurry has a pH between 2.5 and 7.0.
12. The method of Claim 11, wherein the abrasive comprises silica having a surface area 500 m<sup>2</sup>/g.
13. The method of Claim 12, wherein the corrosion inhibitor is selected from the group consisting of benzotriazole and cetyltrimethylammonium bromide.
14. The method of Claim 11, wherein the corrosion inhibitor is benzotriazole and the surfactant is selected from the group consisting of cetyltrimethylammonium bromide and cetyltrimethylammonium hydroxide.

15. (Amended) The method of Claim [14] 11, wherein the slurry has [a pH of 3.8 and] a density of 1.03 g/ml.

16. (Amended) The method of Claim [15] 11, wherein the oxidizer comprises hydrogen peroxide; and the chelating buffer system comprises citric acid and potassium citrate.